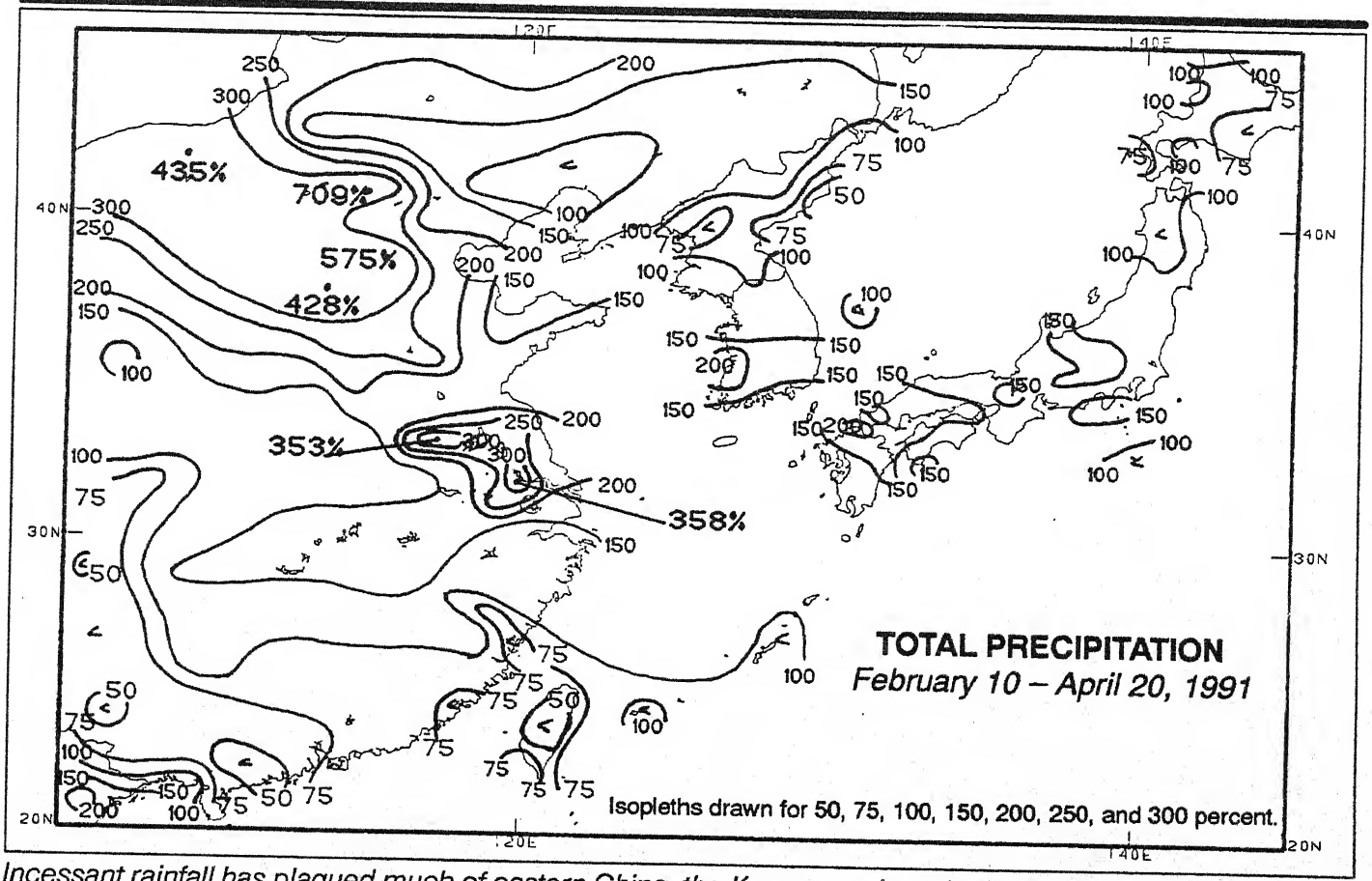
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 91/16 **Washington, DC**



Incessant rainfall has plagued much of eastern China, the Koreas, and southern Japan for over two months. During February 10 - April 20, 1991, rainfall totals ranged from 15-100 mm across typically drier regimes in the northwestern corner of the map (i.e., through central Inner Mongolia) to 500-600 mm in portions of southwestern Japan and interior east-central China (southwest of Shanghai). Moisture surpluses over 100 mm accumulated across the southern half of Japan, southern South Korea, and much of east-central China, reaching 250-345 mm in the southern Tokyo suburbs, extreme southern Shikoku, portions of north-central Kyushu, and the western Shanghai suburbs. In contrast, unusually light rains fell on Taiwan and central and south-central China, where some locations measured less than half the normal rainfall.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CENTER

CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *U.S. cooling degree days (summer) or heating degree days (winter).*
- *Global two–week temperature anomalies.*
- *Global four–week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three–month precipitation anomalies (once a month).*
- *Global twelve–month precipitation anomalies (every three months).*
- *Global three–month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF APRIL 20, 1991

1. Central United States:

ANOTHER WET WEEK.

Scattered moderate precipitation fell across the northern half of the region while heavy rains (up to 240 mm near New Orleans) deluged portions of the lower Mississippi Valley. Portions of northwestern Louisiana measured over 650 mm of rain during the last two weeks, with widespread urban and river flooding of varying severity affecting much of the region (see United States Weekly Climate Highlights for more details) [4 weeks].

2. West-Central South America:

LATE-SEASON HEAT WAVE ENDS.

Temperatures averaged near normal across central Chile, bringing an end to the recent spell of hot weather [Ended after 7 weeks].

3. Ireland and Scotland:

PRECIPITATION SLACKENS.

Little or no precipitation fell across Ireland while only a small portion of northeast Scotland measured 5–15 mm. Despite the relatively dry week, however, significant short-term moisture surpluses remain, particularly across central and eastern Scotland [Ending after 3 weeks].

4. The Middle East:

LOWER RAINFALL TOTALS MEASURED.

Scattered 10–30 mm totals were observed through east-central, north-central, interior southwestern, and southeasternmost coastal Turkey as well as across northern Iran. Elsewhere, little or no rainfall engendered some relief from the recent wet spell, although significant short-term deficits remain [Ending after 5 weeks].

5. Southeastern Africa:

WET SEASON MAY HAVE ENDED EARLY.

After 1.5 months of abnormally wet weather, a third consecutive dry week (only scattered 3–7 mm totals) may signify an early end to the region's wet season as the progression into the typically drier time of year continued [3 weeks].

6. Japan and East-Central China:

ANOTHER WEEK WITH SOAKING RAINS.

Only moderate rains fell across Japan, where much of the three southernmost islands recorded 5–20 mm of rain, with totals of 35–55 mm moistening central and northwestern Honshu. Moderate rains (10–45 mm) were also reported across northern east-central China, but deluging downpours soaked South Korea and most of eastern China to the south and west of Shanghai. Most of South Korea observed 30–80 mm, with 100–160 mm along the southern coast, while 50–125 mm were recorded in southern east-central China (see Front Cover for more details) [10 weeks].

7. The Philippines:

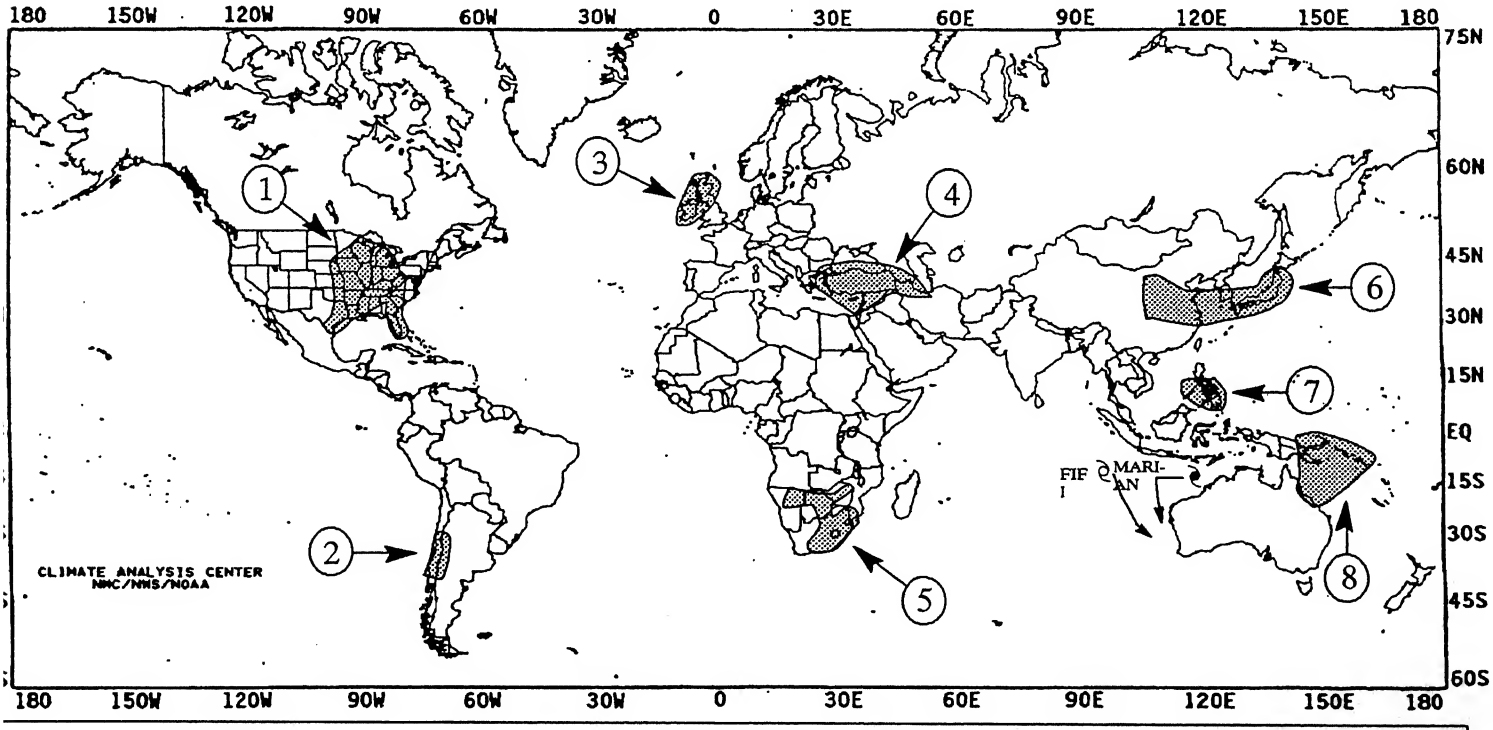
MODERATE RAINFALL PROVIDES LIMITED RELIEF.

Little or no rain fell on northern Luzon, but higher totals were measured throughout the eastern fringes of the islands and through Mindanao. Most of southeastern Luzon and Samar received 20–80 mm while 10–25 mm generally fell across Mindanao. Totals were lighter across the west-central islands, where only scattered amounts of 5–20 mm were measured [20 weeks].

8. Northern and Eastern Australia and Papua New Guinea:

A DAMP WEEK SLIGHTLY DECREASES MOISTURE DEFICITS.

Amounts of 20–60 mm fell across the region for the second consecutive week, slightly improving the moisture situation across the region. Unfortunately, southern sections of affected Australia deteriorated somewhat as only 1–2 mm of rain fell [9 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation and temperature data are this week's values, unless otherwise indicated.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two-week temperature anomalies, four-week precipitation anomalies, longer-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF APRIL 14–20, 1991

For the second consecutive week, strong thunderstorms soaked parts of the South while wintry conditions prevailed across portions of the Great Plains and Rockies. Up to 9 inches of rain fell on already–saturated ground across the lower Mississippi Valley and south–central Plains, causing widespread flooding from Texas to Mississippi (see Figure 1). Thunderstorms dumped an additional 6 inches of rain in Shreveport, LA this week with nearly 3 inches falling during a two–hour period. Northwestern Louisiana continued to be hard hit by the storms, with some areas measuring over thirty inches of rain since April 12th. In addition, several inches of rain further raised river levels in Arkansas, Texas and Mississippi, with flooding reported along a dozen rivers. Heavy rain also accompanied thunderstorms that moved through parts of the mid–Atlantic. Up to 6 inches of rain fell on Norfolk, VA on Saturday, the greatest 24–hour total since the Tidewater was hit by Hurricane Cleo in September 1964. The deluge also established a new 24–hour record total for the month of April. Meanwhile, heavy rain over parts of North Carolina caused flooding and forced the closure of several roads in Lenoir, NC. Farther west, up to 6 inches of snow covered the Black Hills and portions of Montana while nearly 18 inches buried parts of Wyoming. Unseasonably cold conditions affected parts of the Rockies and Great Basin, where lows dipped into the teens. In sharp contrast, unusually mild conditions prevailed across most of Alaska with some locations warming into the fifties.

The week began with an area of low pressure over the nation's midsection and its trailing front stretching through the Southern Plains. Strong thunderstorms erupted along and ahead of the front, dumping up to 2.5 inches of rain in thirty minutes in Austin County, TX. To the north of the storm system, a wintry mixture of precipitation covered portions of the Northern Plains and upper Midwest. The storm eventually tracked into southeastern Canada, dragging the trailing front eastward. Ahead of the front, unseasonably warm weather made a brief appearance in the East on Tuesday, with daily record highs reported from Florida to New York. In sharp contrast, wintry weather gripped parts of the Rockies as a storm tracked through the Great Basin. Heavy snow blanketed portions of southern Montana while cold air behind the storm settled into portions of the Far West. Lows dipped into the teens in Nevada, and frost glazed some central California valleys as readings dropped into the thirties.

During the latter half of the week, the Rockies low shifted into the middle Mississippi Valley, spawning more thunderstorms across portions of the Great Plains and Deep South. Several of the storms dumped hail and spawned tornadoes in the Great Plains on Wednesday while one storm dropped 3 inches of rain on Shreveport, LA in 2 hours, causing localized flooding. The storm system slowly tracked to the Ohio Valley, dumping heavy rain across the lower Great Lakes. Flooding was reported along the Kankakee River in northwestern Indiana after 3 inches of rain fell on some locations. Farther south, thunderstorms caused extensive damage to trees and power lines on Ladi Island, SC. Toward the weekend, an area of low pressure developed and intensified rapidly off the coastal Carolinas and tracked slowly northeastward along the Eastern Seaboard. Heavy rain soaked some locations along the mid–Atlantic coast with Norfolk, VA measuring up to 6 inches of rain. To the north, wintry weather pushed eastward into the northern Plains. Heavy snow covered parts of the Black Hills and parts of western Nebraska. Farther west, thunderstorms rumbled through San Francisco, CA as a cold front moved onshore. Rain fell from central California to southern Oregon while snow blanketed the Sierra Nevada

According to the River Forecast Centers, the greatest weekly totals (more than 2 inches) fell on the south–central Great Plains, southern two–thirds of the Mississippi Valley, the Tennessee Valley, parts of Florida and the coastal Plains of Georgia and the Carolinas, the southern Appalachians, portions of the mid–Atlantic, the lower Great Lakes, and southern Alaska (see Table 1). Moderate amounts fell across most of New England, the remainders of the mid–Atlantic and the Southeast, the Ohio Valley, the Great Lakes, portions of the northern Rockies, northern California, southern Alaska, and Hawaii. Little or no precipitation was reported in northern Maine, the northern Plains, the central and southern High Plains, the remainder of the Rockies, the Southwest, the rest of California, the Pacific Northwest, Alaska, and Hawaii.

Unseasonably warm conditions were confined primarily to the southeastern quarter of the nation where weekly departures between +5°F and +7°F were observed from the Gulf Coast to portions of the central Appalachians (see Table 2). Departures between +2°F and +4°F were reported from the southern Plains to the the Midwest. In addition, weekly departures to +6°F were recorded at a few locations in the Northwest while departures between +10°F and +14°F were observed across northern Alaska. Departures between +3°F and +9°F were common across the remainder of Alaska as highs topped 60°F on Annette Island.

In sharp contrast, unseasonably cool conditions dominated much of the West. Weekly departures between –8°F and –12°F were reported across portions of the northern Rockies while –4°F to –7°F departures were observed across parts of California, the northern Plains, and a small portion of the north Atlantic Coast (see Table 3). Temperatures remained near or slightly below normal across most of the remainder of the contiguous U.S., including portions of the East, despite a brief period of record warmth early in the week.

TABLE 1. Selected stations with 3.00 or more inches of precipitation during the week of April 14-20, 1991.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
NEW ORLEANS/LAKE FRONT, LA	9.38	BATON ROUGE, LA	3.81
NEW ORLEANS NAS, LA	6.40	TUPELO, MS	3.77
BOSSIER CITY/BARKSDALE AFB, LA	6.26	LUFKIN, TX	3.73
NORFOLK, VA	6.07	WEST PALM BEACH, FL	3.70
NEW ORLEANS/MOISANT, LA	5.94	SAVANNAH, GA	3.58
SHREVEPORT, LA	5.82	HOUSTON/ELLINGTON AFB, TX	3.46
NORFOLK/NAS(CHAMBER FIELD), VA	5.60	VIRGINIA BEACH/OCEANA NAS, VA	3.45
ALEXANDRIA/ENGLAND AFB, LA	5.44	HOMESTEAD AFB, FL	3.43
LAFAYETTE, LA	4.44	JACKSON, MS	3.34
GREENSBORO, NC	4.43	MEMPHIS NAS, TN	3.23
LAKE CHARLES, LA	4.01	MEMPHIS, TN	3.15
COLUMBUS AFB, MS	4.01	HAMPTON/LANGLEY AFB, VA	3.06
MUSCLE SHOALS, AL	3.90	PORT ARTHUR, TX	3.03

TABLE 2. Selected stations with temperatures averaging 6.0°F or more ABOVE normal for the week of April 14-20, 1991.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
NOME, AK	+14.1	32.6	VALPARAISO/EGLIN AFB, FL	+7.1	73.1
KOTZEBUE, AK	+13.8	27.1	COLUMBUS, GA	+6.9	72.1
BETTLES, AK	+11.2	34.6	CHARLESTON, SC	+6.6	62.6
BETHEL, AK	+10.8	35.1	MONTGOMERY/MAXWELL AFB, AL	+6.5	72.1
BIG DELTA, AK	+9.4	41.5	AUGUSTA, GA	+6.5	70.1
BARROW, AK	+9.3	8.5	CROSSVILLE, TN	+6.4	62.4
MCGRATH, AK	+8.7	36.9	CAPE HATTERAS, NC	+6.1	65.9
FAIRBANKS, AK	+8.0	39.7	APALACHICOLA, FL	+6.0	74.1
NORTHWAY, AK	+7.7	37.0	MACON, GA	+6.0	71.8
ATLANTA, GA	+7.3	69.5	BRISTOL, TN	+6.0	62.7

TABLE 3. Selected stations with temperatures averaging 3.5°F or more BELOW normal for the week of April 14-20, 1991.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
BILLINGS, MT	-8.0	37.1	OMAHA/EPPLEY, NE	-3.7	49.3
WORLAND, WY	-7.8	38.2	GRAND FORKS, ND	-3.6	38.2
SHERIDAN, WY	-6.8	36.6	MILES CITY, MT	-3.6	42.1
LANDER, WY	-5.6	37.2	MINNEAPOLIS, MN	-3.6	43.3
REDDING, CA	-5.5	55.1	PIERRE, SD	-3.6	43.4
DICKINSON, ND	-5.2	36.8	BOSTON/LOGAN, MA	-3.6	45.3
RAPID CITY, SD	-5.1	40.1	GOODLAND, KS	-3.6	45.9
VALENTINE, NE	-5.1	41.3	SANTA BARBARA, CA	-3.6	53.3
BLUE CANYON, CA	-4.5	39.0	BISMARCK, ND	-3.5	39.9
SCOTTSBLUFF, NE	-4.2	42.8	ST. CLOUD, MN	-3.5	40.5
LEWISTOWN, MT	-3.9	36.4	GARDEN CITY, KS	-3.5	50.8
BAKERSFIELD, CA	-3.8	59.0	PASO ROBLES, CA	-3.5	52.6

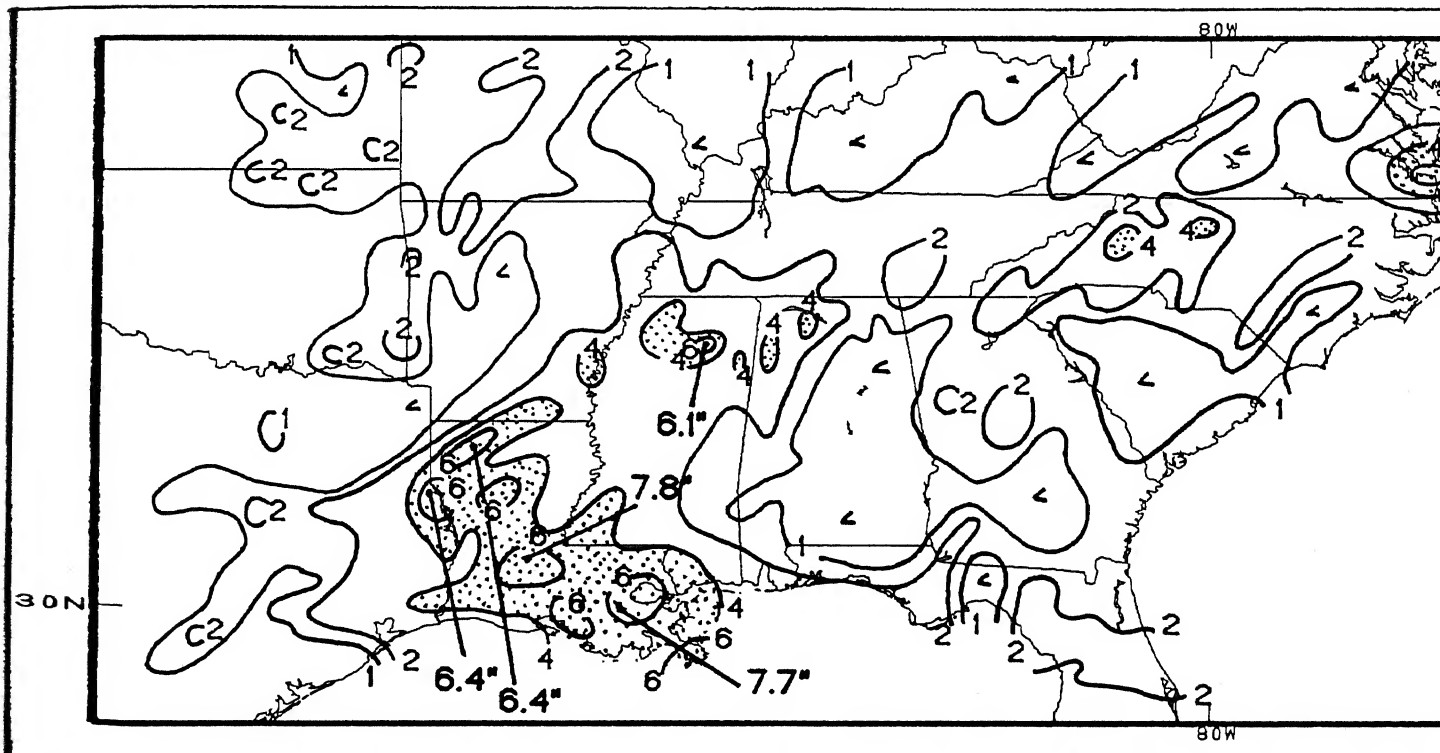
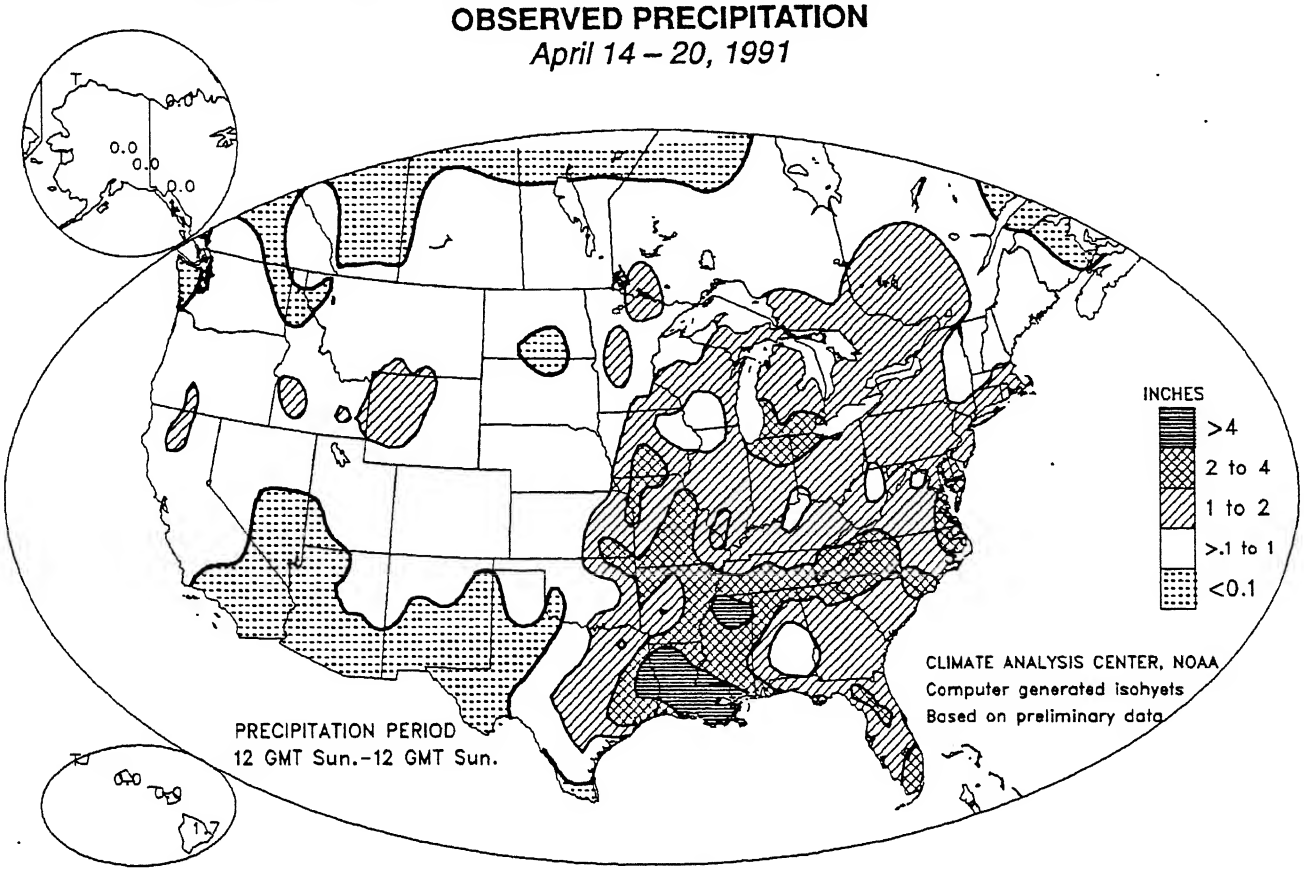


FIGURE 1. *Total precipitation across the south-central and southeastern U.S. during April 14-20, 1991. Isopleths are for 1, 2, 4, and 6 inches, with shaded areas receiving more than 4 inches. Showers and thunderstorms, some with powerful gusts, large hail, and tornados, pounded portions of the region for the second consecutive week. Heavy rains brought widespread flooding to the lower Mississippi Valley, where some locations have measured over 25 inches of rain during the last two weeks and to parts of the Virginia Tidewater, where up to six inches of rain fell during a ten-hour cloudburst. Norfolk, VA measured greatest 24-hr. rainfall total since Hurricane Cleo invaded the region in 1964, establishing a new 24-hr. record total for*

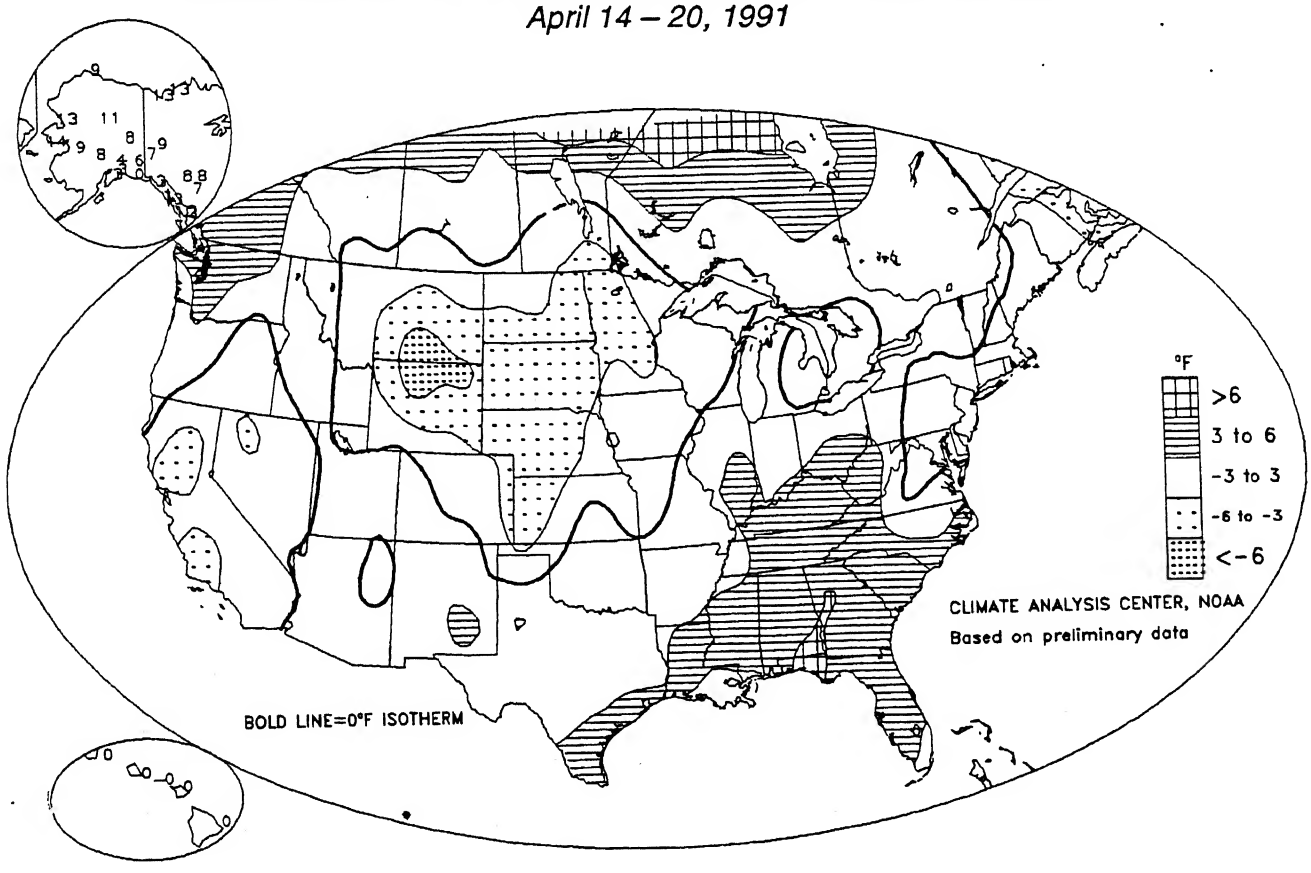
OBSERVED PRECIPITATION

April 14 – 20, 1991



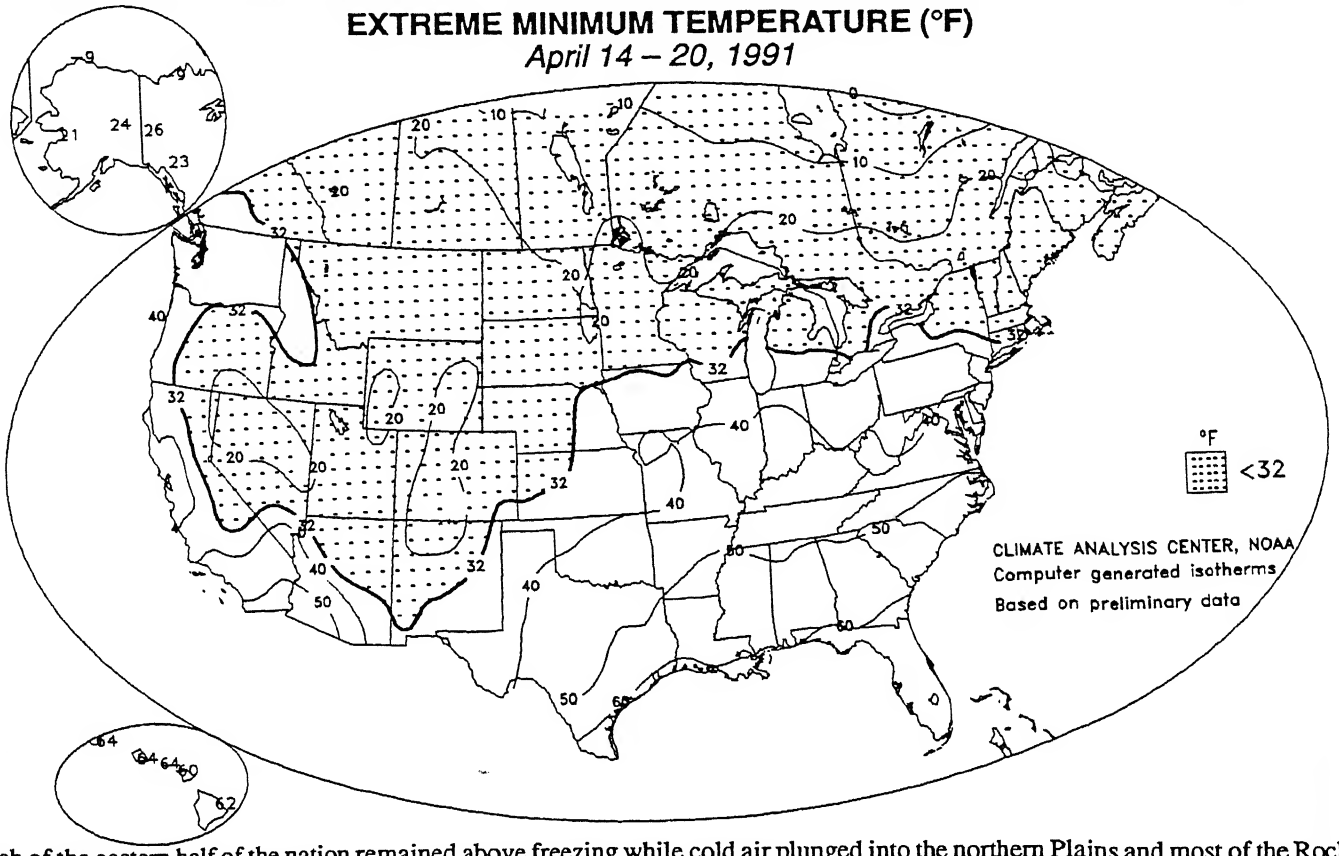
DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

April 14 – 20, 1991



EXTREME MINIMUM TEMPERATURE (°F)

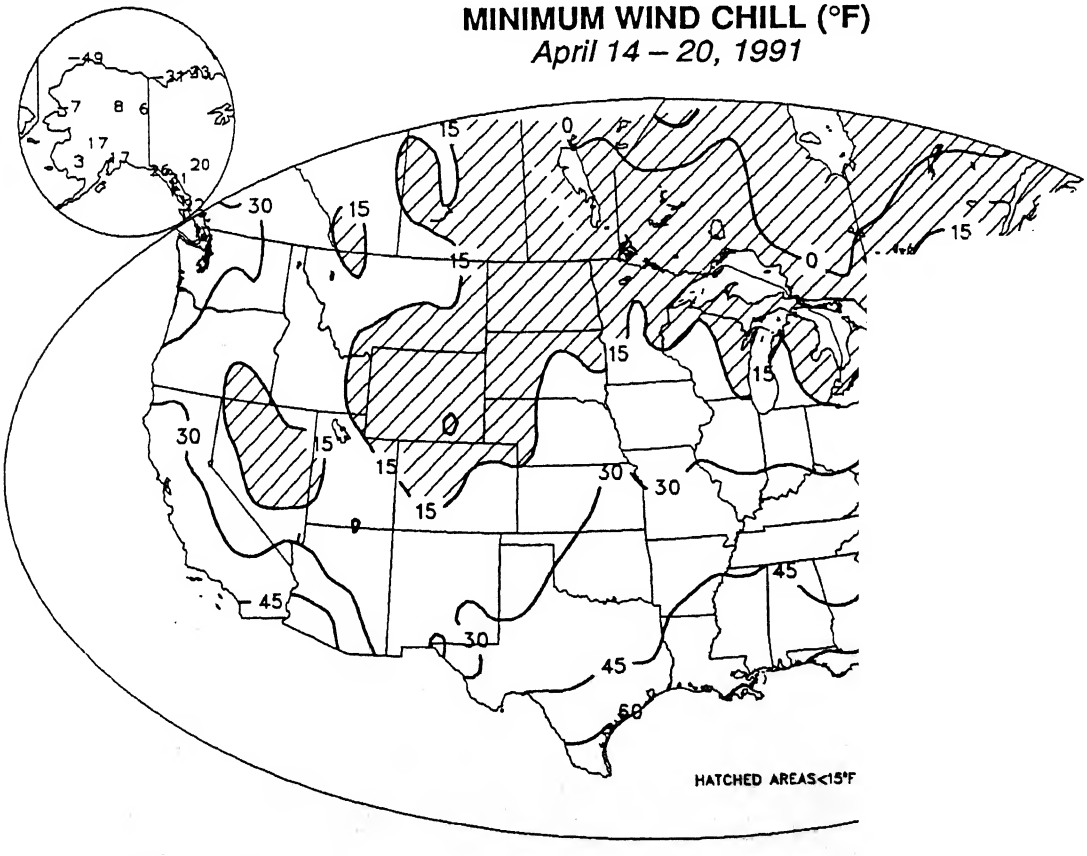
April 14 – 20, 1991



Much of the eastern half of the nation remained above freezing while cold air plunged into the northern Plains and most of the Rockies and Intermountain West, where lows dropped below 20°F in spots (top). Gusty northerly winds accompanied the cold air, bringing wind chills below 15°F to much of the Great Basin, the central Rockies, and portions of the central and northern Plains, the Great Lakes, and northern New England (bottom).

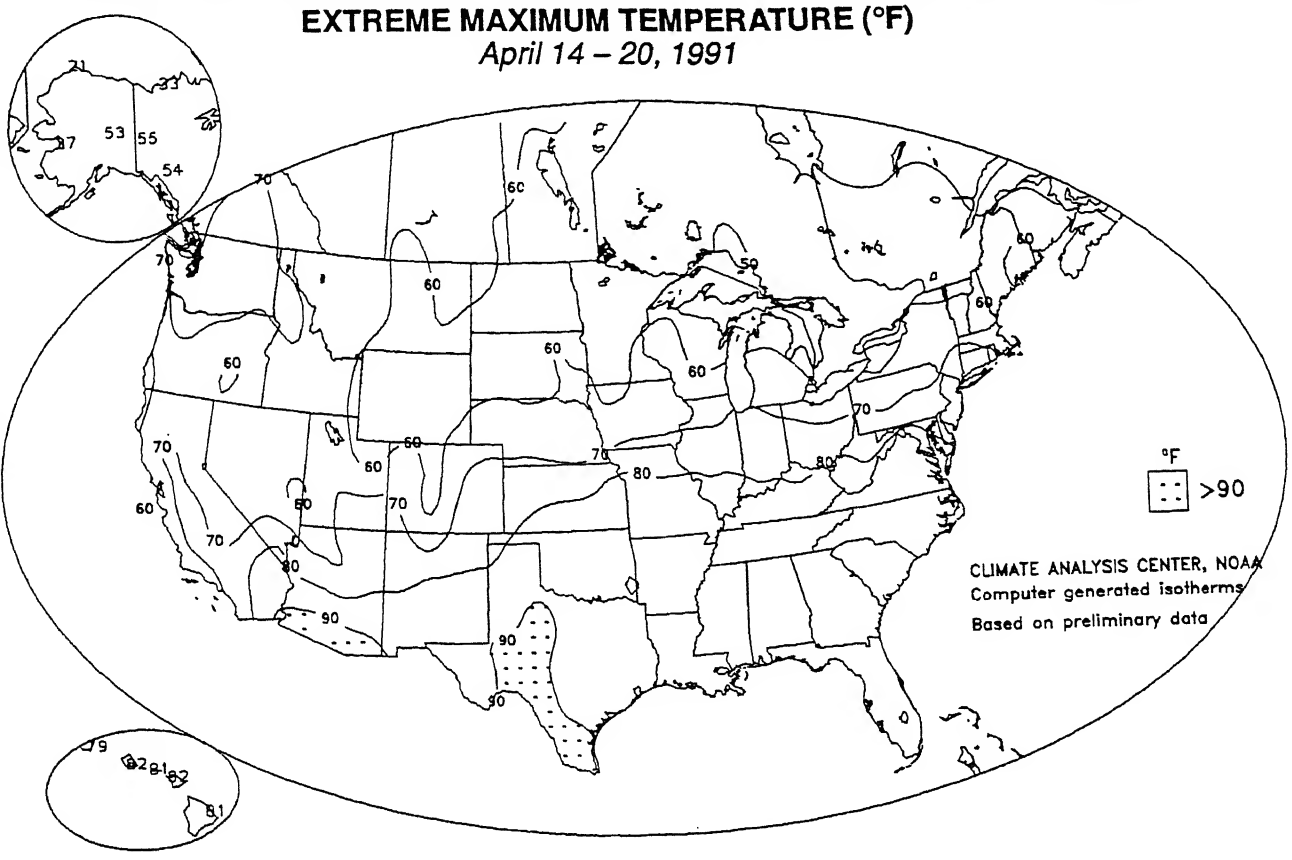
MINIMUM WIND CHILL (°F)

April 14 – 20, 1991



EXTREME MAXIMUM TEMPERATURE (°F)

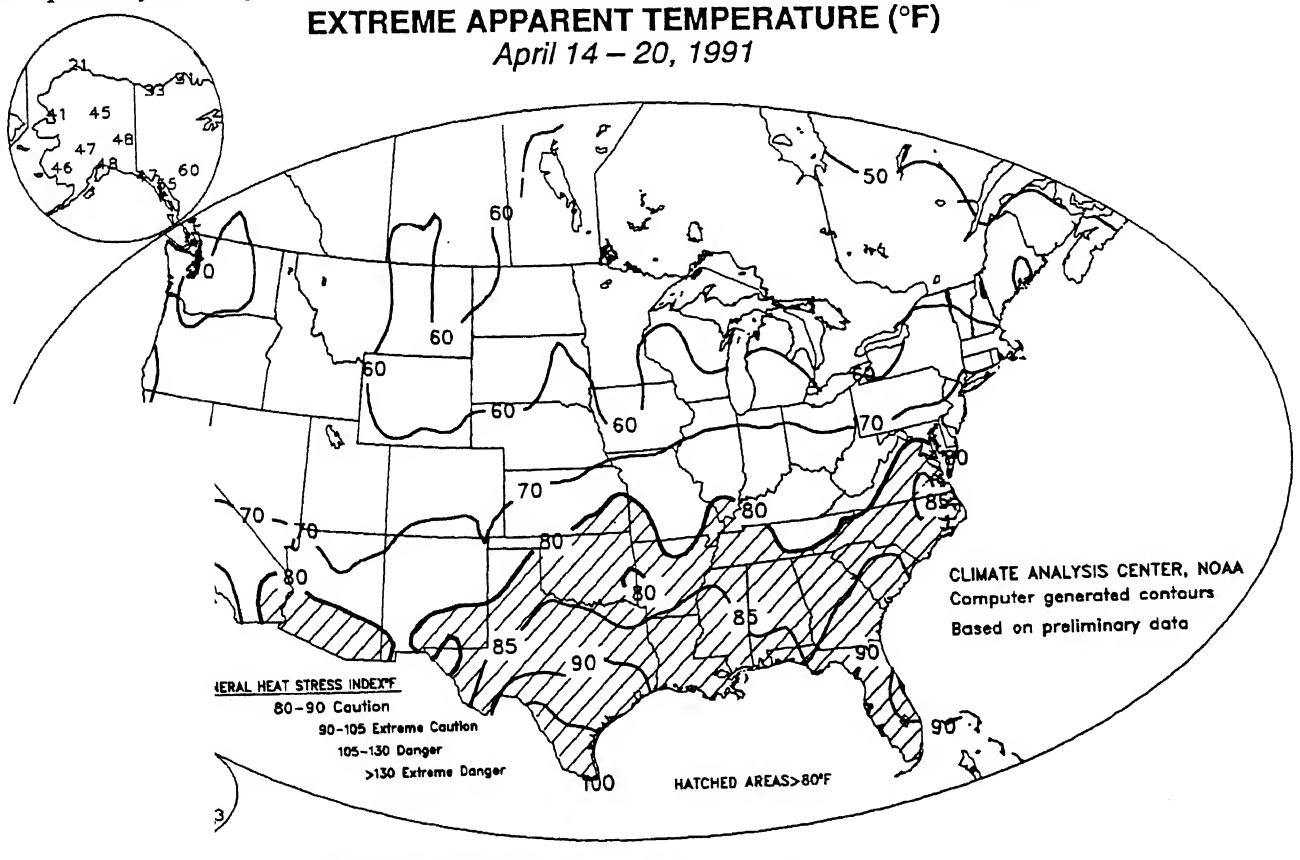
April 14 – 20, 1991



n the week, highs reached into the eighties from the desert Southwest eastward through the southern Plains, Southeast, and mid–
ic, but nineties were restricted to small portions of central and southern Texas and extreme southern Arizona (top). The warmth
ccompanied by relatively low humidity, however, keeping apparent temperatures close to actual readings (bottom).

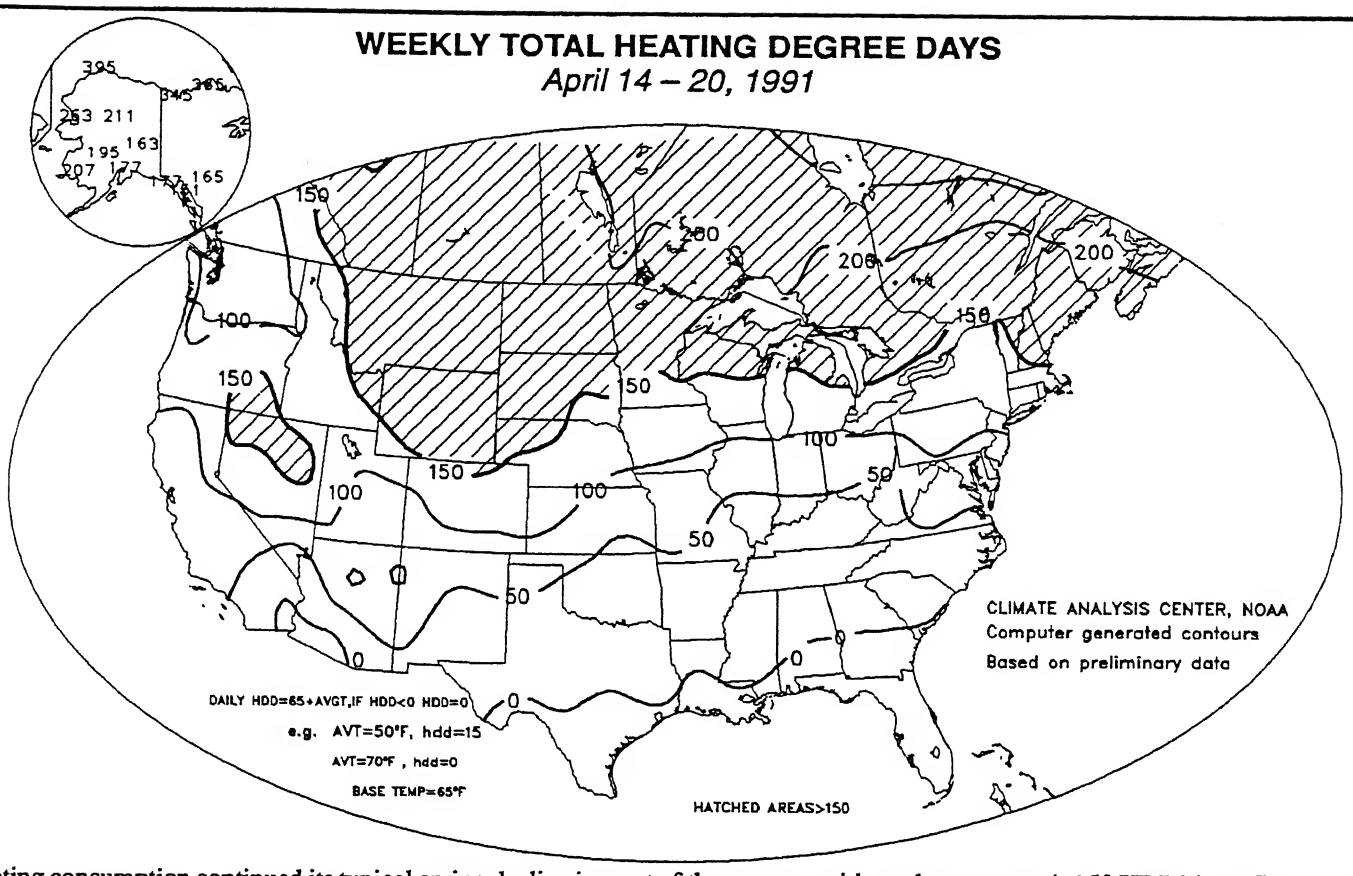
EXTREME APPARENT TEMPERATURE (°F)

April 14 – 20, 1991



WEEKLY TOTAL HEATING DEGREE DAYS

April 14 – 20, 1991



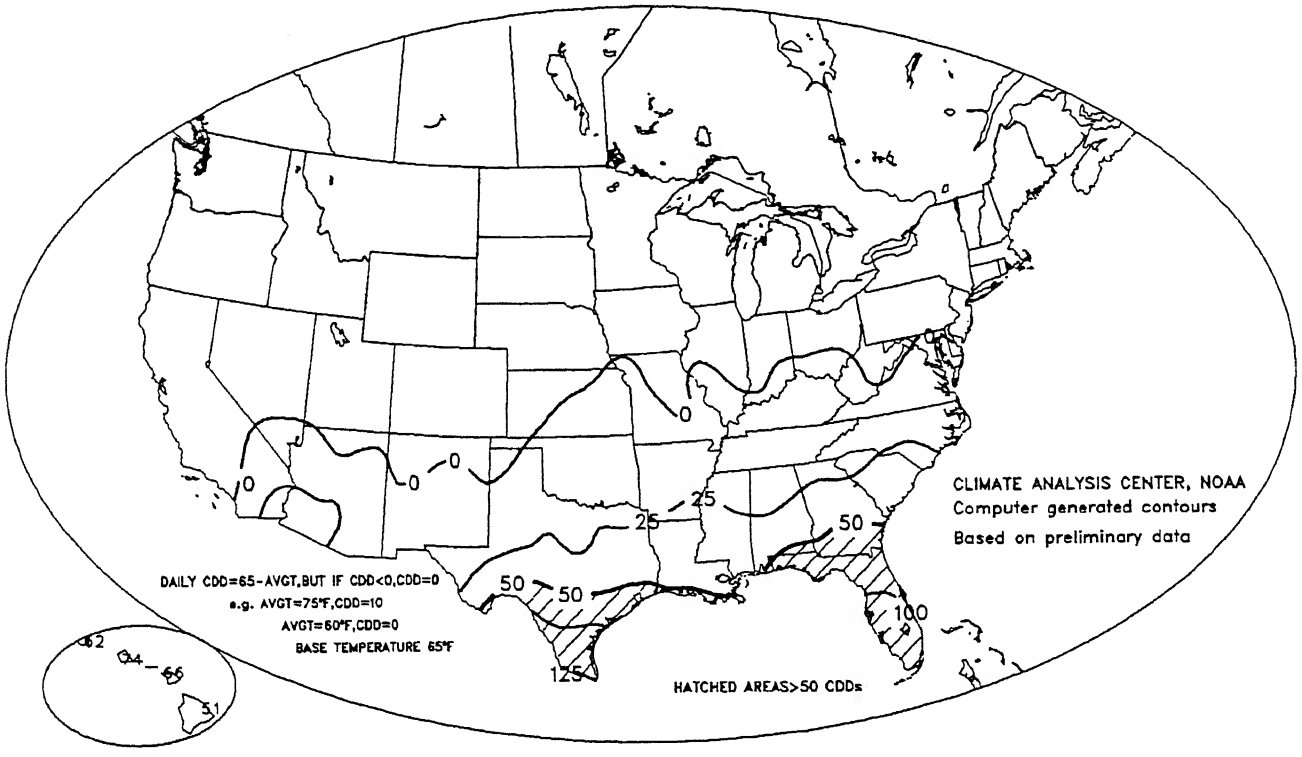
Heating consumption continued its typical spring decline in most of the country, with moderate usage (>150 HDD's) confined to parts of the northern Great Basin, central and northern Rockies, and extreme northern sections of the Plains, Midwest, and New England (top). Significant departures from normal heating usage were found in abnormally chilly sections of the northern Rockies and Plains and across the unusually mild central and southern Appalachians and lower Ohio and Eastern Tennessee Valleys (bottom).

WEEKLY DEPARTURE FROM NORMAL HDD

April 14 – 20, 1991

WEEKLY TOTAL COOLING DEGREE DAYS

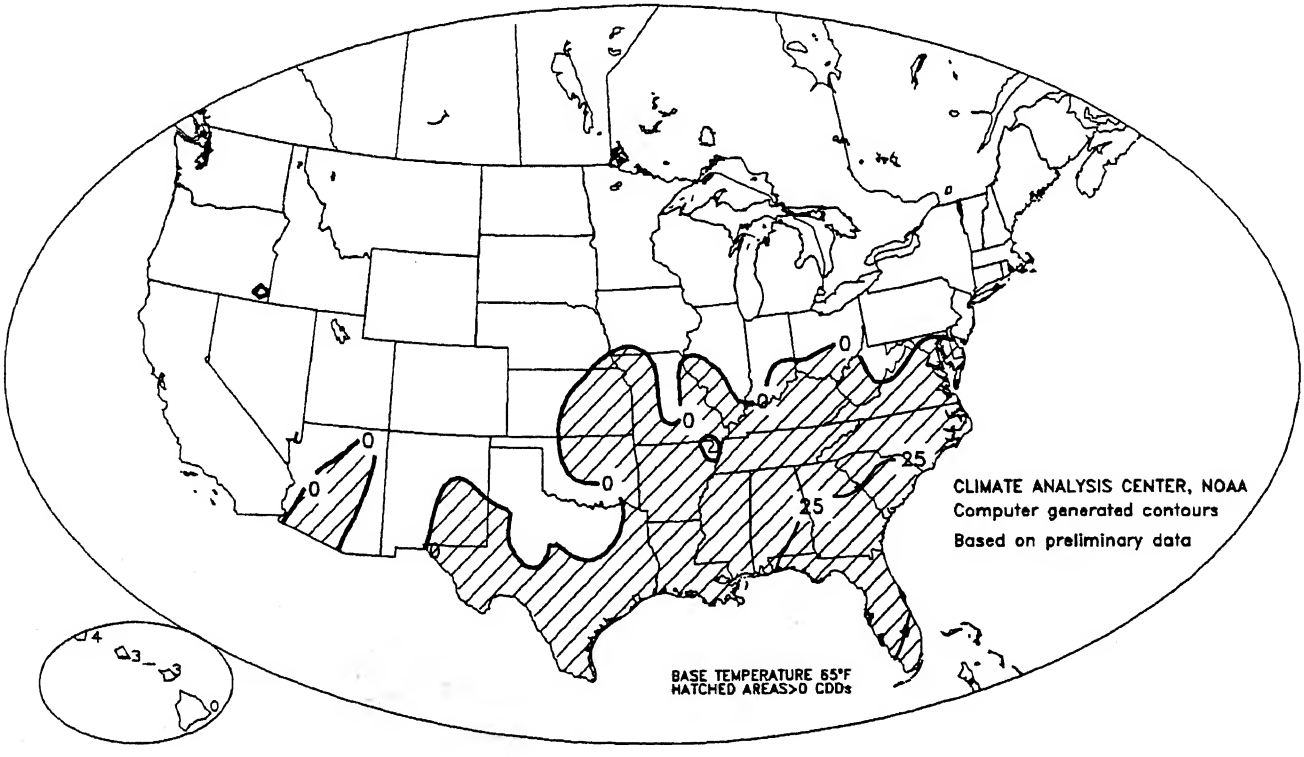
April 14 – 20, 1991



Warm air early in the week allowed for moderate cooling usage (>50 CDD's) across southern Texas, the immediate Gulf Coast, and Florida (top) and produced significantly above normal cooling demand through the southern Atlantic states (bottom).

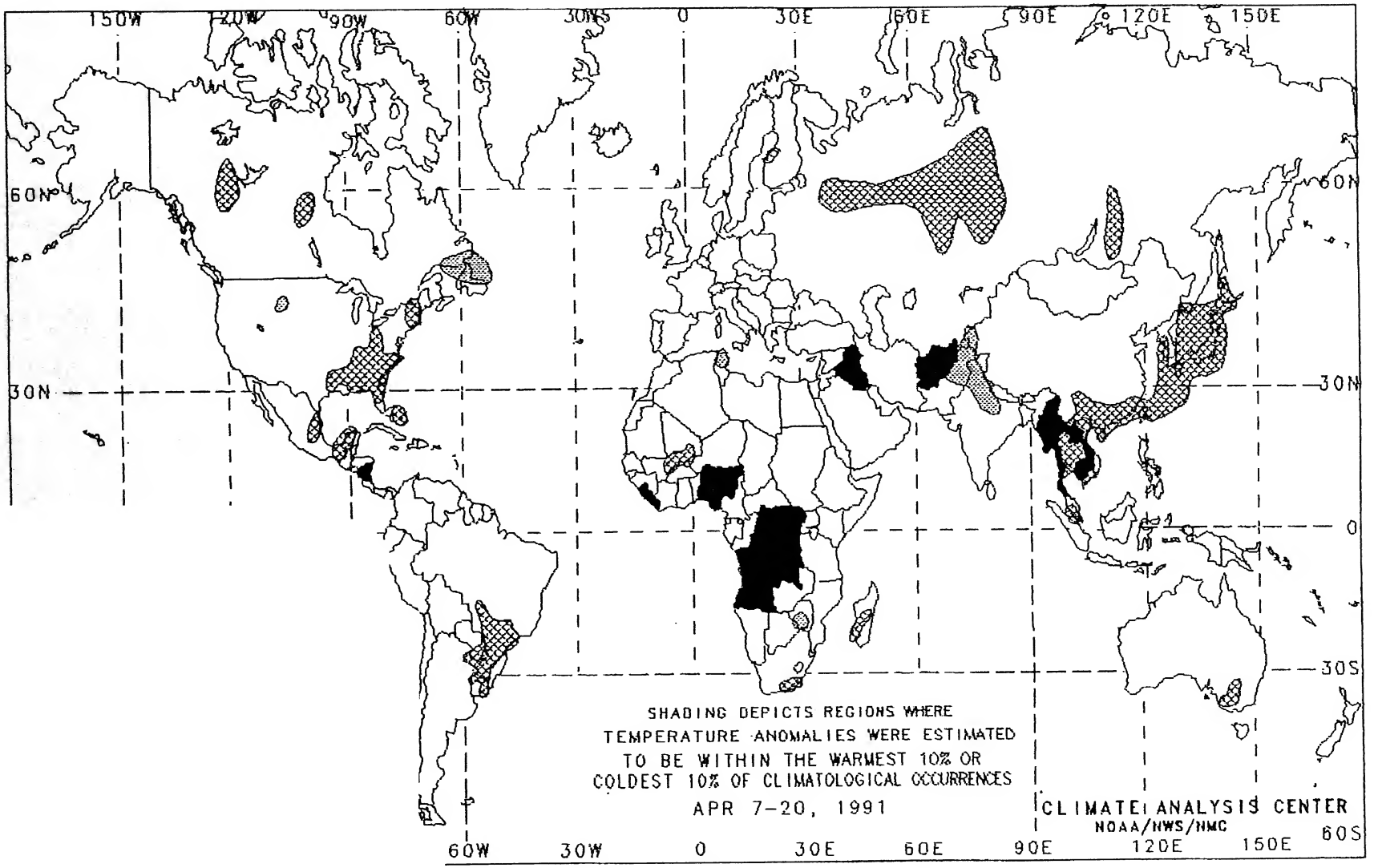
WEEKLY DEPARTURE FROM NORMAL CDD

April 14 – 20, 1991



2–WEEK GLOBAL TEMPERATURE ANOMALIES

APRIL 7 – 20, 1991



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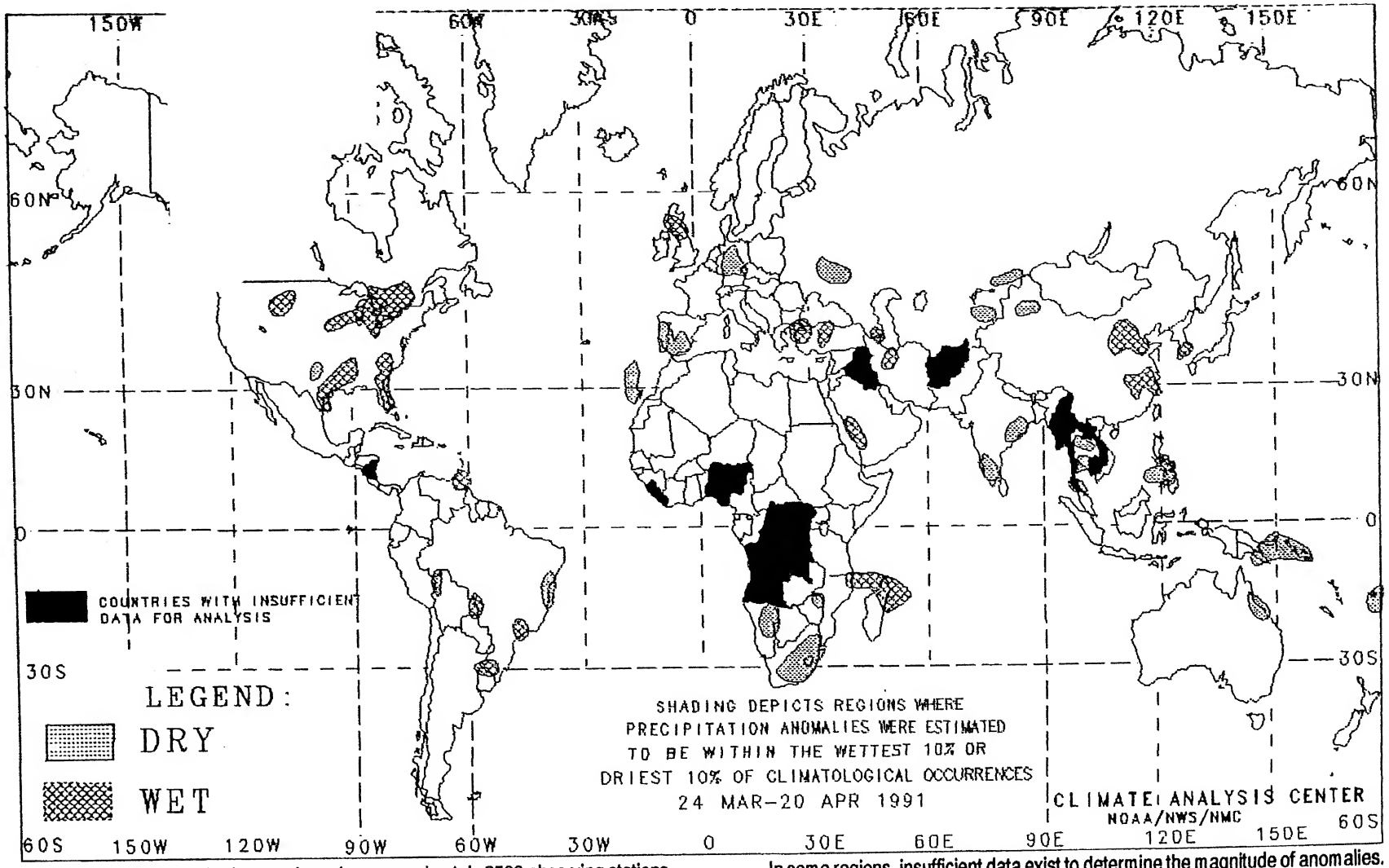
In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

perature

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

MARCH 24 – APRIL 20, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

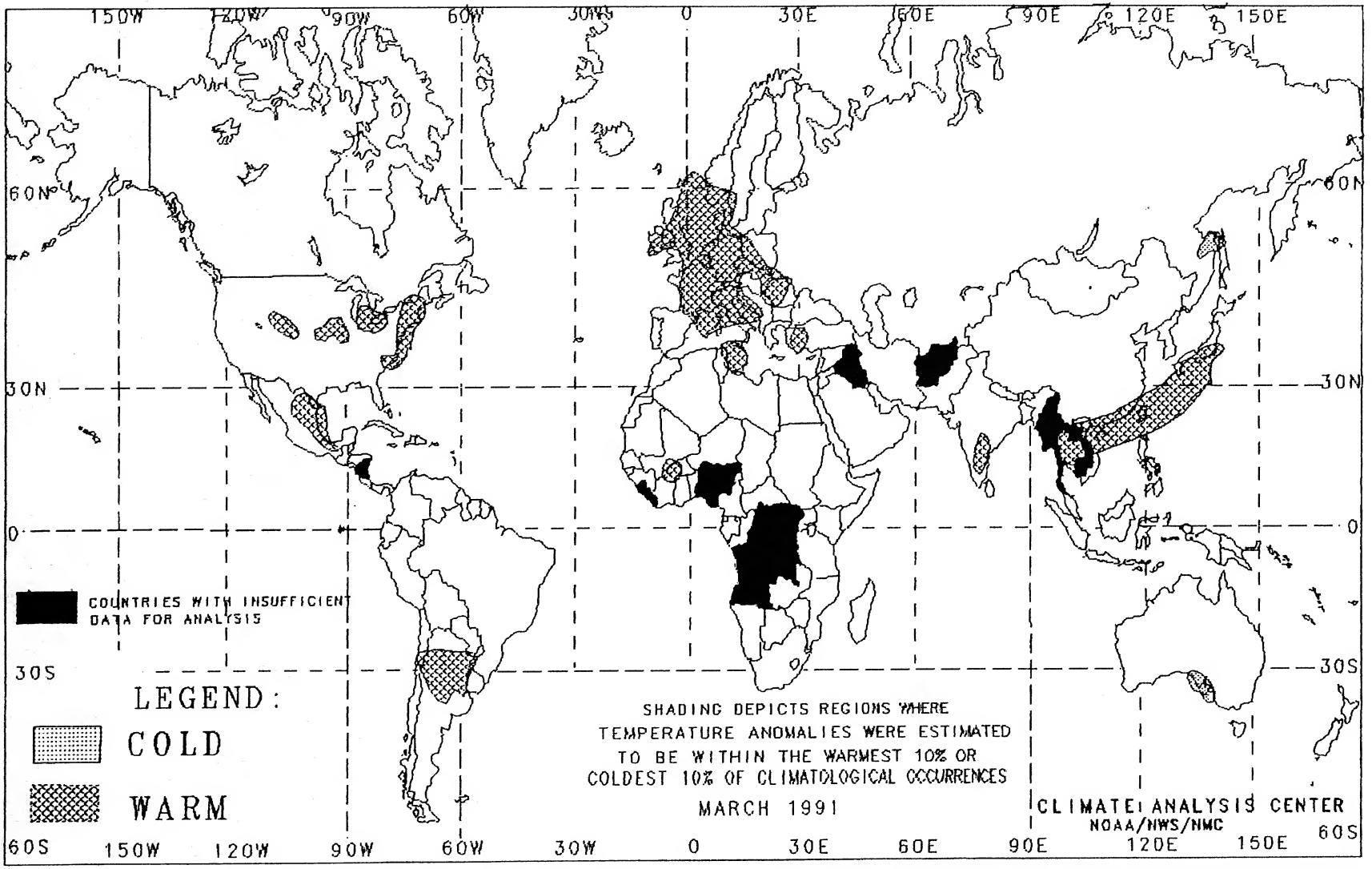
In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL TEMPERATURE ANOMALIES

MARCH 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 26 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty–four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warM anomalies..

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of one month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

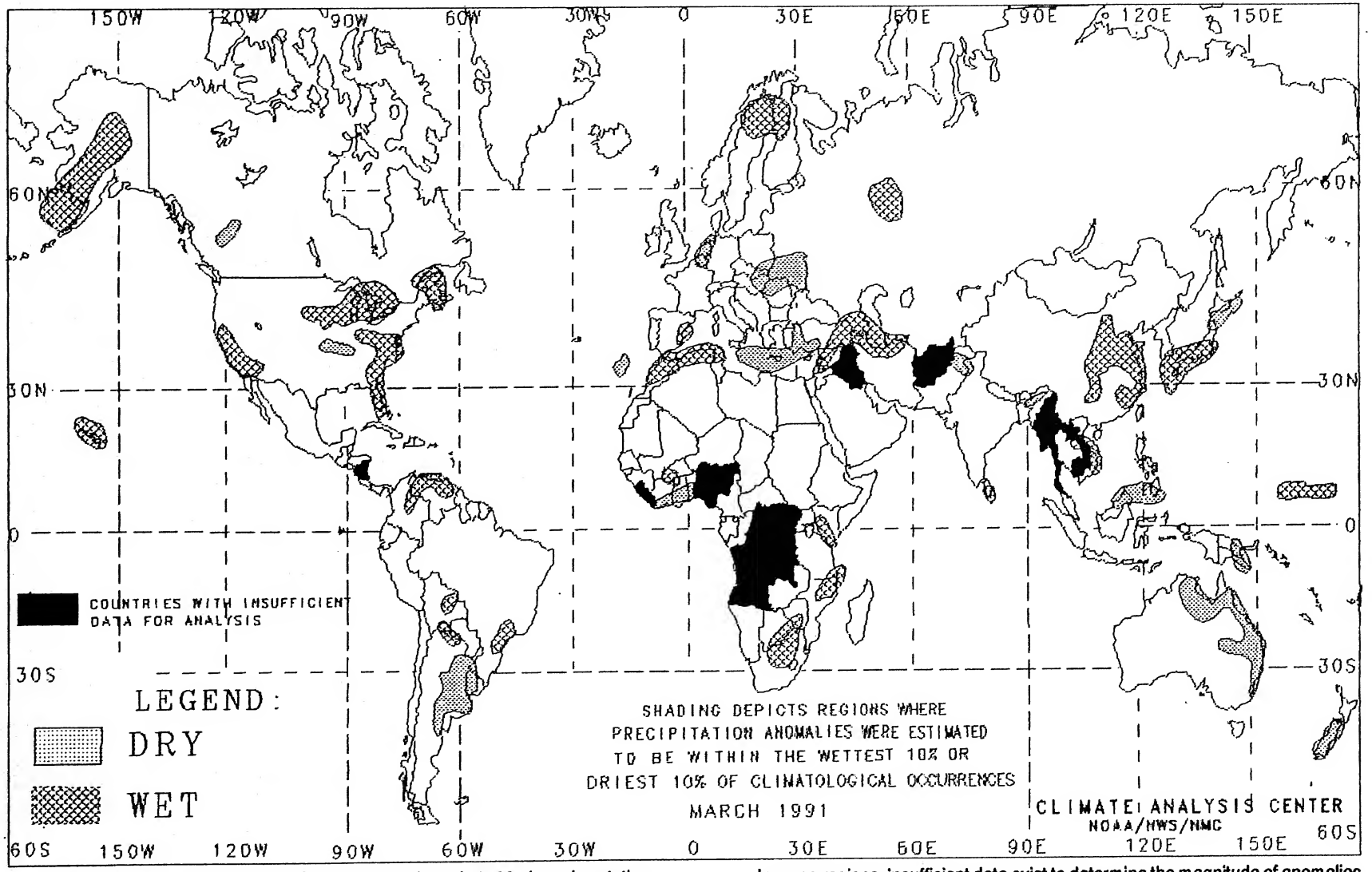
PRINCIPAL TEMPERATURE ANOMALIES

MARCH 1991

REGIONS AFFECTED	TEMPERATURE AVERAGE (°C)	DEPARTURE FROM NORMAL (°C)	COMMENTS
NORTH AMERICA			
Eastern Rockies	+3 to +6	Around +3	WARM – 10 to 14 weeks
Central United States	+6 to +10	+3 to +4	WARM – 10 to 14 weeks
Southern Great Lakes	+3 to +6	Around +3	WARM – 6 to 14 weeks
Eastern United States	+2 to +14	+2 to +3	WARM – 2 to 5 weeks
Eastern Mexico	+22 to +27	+2 to +4	WARM – 5 to 10 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
Central South America	+20 to +27	+2 to +3	WARM – 2 to 9 weeks
EUROPE AND THE MIDDLE EAST			
Europe	–7 to +14	+2 to +4	WARM – 2 to 7 weeks
Southwestern Turkey	+8 to +11	Around +3	WARM – 2 to 5 weeks
AFRICA			
Tunisia and Libya	+15 to +18	Around +2	Very warm first half of March
Burkina Faso and Mali	+31 to +32	Around +2	Very warm early and late in March
ASIA			
Southern India	+27 to +30	Around +2	Very warm first half of March
Eastern Asia	+8 to +33	+2 to +3	WARM – 2 to 5 weeks
Southeastern Siberia	–16 to –14	–3 to –4	COLD – 8 weeks
AUSTRALIA AND WESTERN PACIFIC			
South Central Australia	+18 to +25	Around –2	Very cool first half of March

GLOBAL PRECIPITATION ANOMALIES

MARCH 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the one month period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total one month precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of one month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

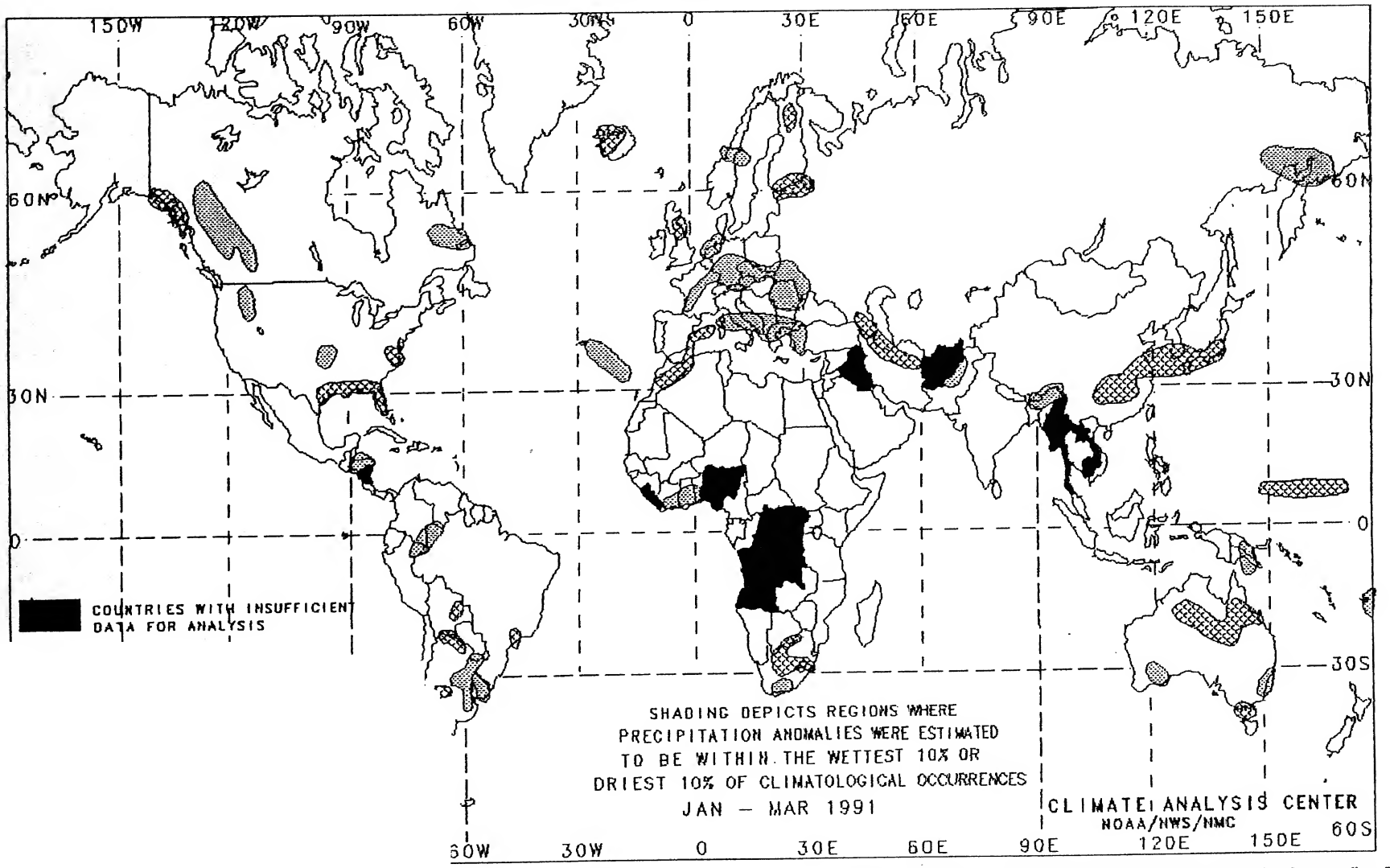
PRINCIPAL PRECIPITATION ANOMALIES

MARCH 1991

GIONS AFFECTED	PRECIPITATION TOTAL (MM)	PERCENT OF NORMAL	COMMENTS
NORTH AMERICA			
ıska	55 to 110	194 to 558	WET – 2 to 10 weeks
ıthwestern Canada	4 to 15	20 to 42	DRY – 6 to 18 weeks
ıthwestern United States	52 to 239	257 to 509	WET – 5 to 10 weeks
rth–Central United States and South–Central Canada	45 to 160	157 to 243	WET – 4 to 8 weeks
ıtheastern United States	74 to 319	165 to 239	WET – 2 to 4 weeks
ıtheastern Canada	98 to 178	160 to 195	WET – 4 weeks
ıth–Central United States	18 to 28	33 to 34	DRY – 14 weeks
waiian Islands	248 to 962	217 to 280	WET – 5 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
ok Islands and Samoa	0 to 162	0 to 42	DRY – 5 to 26 weeks
ıezuela and Colombia	52 to 361	211 to 497	WET – 5 weeks
ivia	206 to 208	164 to 203	WET – 2 to 4 weeks
ıtheastern Brazil	218 to 445	157 to 297	WET – 2 to 6 weeks
rthern Argentina	368 to 380	191 to 392	Heavy precipitation first half of March
stern Uruguay and East–Central Argentina	0 to 32	0 to 24	DRY – 4 to 10 weeks
EUROPE AND THE MIDDLE EAST			
rthern Sweden and Northern Finland	57 to 66	199 to 310	WET – 4 to 7 weeks
ıelux Countries	16 to 22	35 to 39	DRY – 12 to 18 weeks
t–Central European Soviet Union	45 to 80	202 to 377	WET – 5 weeks
rainian S.S.R. and Eastern Europe	1 to 7	2 to 23	DRY – 5 to 14 weeks
tern Spain	62 to 111	206 to 417	Heavy precipitation first half of March
tern Mediterranean	8 to 23	19 to 32	DRY – 5 to 6 weeks
dle East	50 to 170	169 to 503	WET – 2 to 5 weeks
deira	0 to 2	0 to 4	DRY – 4 weeks
AFRICA			
theastern Libya	4 to 15	13 to 20	DRY – 5 weeks
rocco, Algeria, and Tunisia	57 to 148	197 to 500	WET – 5 to 9 weeks
tern Burkina Faso	Around 87	259 to 418	Heavy precipitation first half of March
f of Guinea Coast	5 to 20	4 to 31	DRY – 4 weeks
ya	126 to 186	166 to 235	WET – 4 to 5 weeks
thern Mozambique	324 to 506	232 to 238	WET – 4 to 5 weeks
swana and Northern South Africa	114 to 165	145 to 366	WET – 2 to 5 weeks
thern South Africa	8 to 36	19 to 40	DRY – 6 weeks
ASIA			
stan	0 to 7	0 to 10	DRY – 9 to 10 weeks
Lanka	8 to 32	8 to 41	DRY – 14 weeks
eme Eastern India	0 to 11	0 to 10	DRY – 10 weeks
nam and Thailand	71 to 231	247 to 993	WET – 2 to 10 weeks
ıa	50 to 366	167 to 548	WET – 2 to 11 weeks
hern and Central Japan	115 to 363	157 to 245	WET – 4 to 5 weeks
thern Japan	7 to 55	10 to 52	DRY – 4 to 6 weeks
AUSTRALIA AND WESTERN PACIFIC			
ppines and Northern Borneo	1 to 26	2 to 17	DRY – 10 weeks
ıa New Guinea	75 to 174	37 to 48	DRY – 4 to 7 weeks
oline Islands and Marshall Islands	413 to 906	181 to 241	WET – 4 to 6 weeks
Islands	73 to 148	26 to 41	DRY – 8 to 14 weeks
Zealand	24 to 95	18 to 48	DRY – 9 weeks
hern and Eastern Australia	0 to 59	0 to 16	DRY – 5 to 10 weeks

3–MONTH GLOBAL PRECIPITATION ANOMALIES

JANUARY – MARCH 1991



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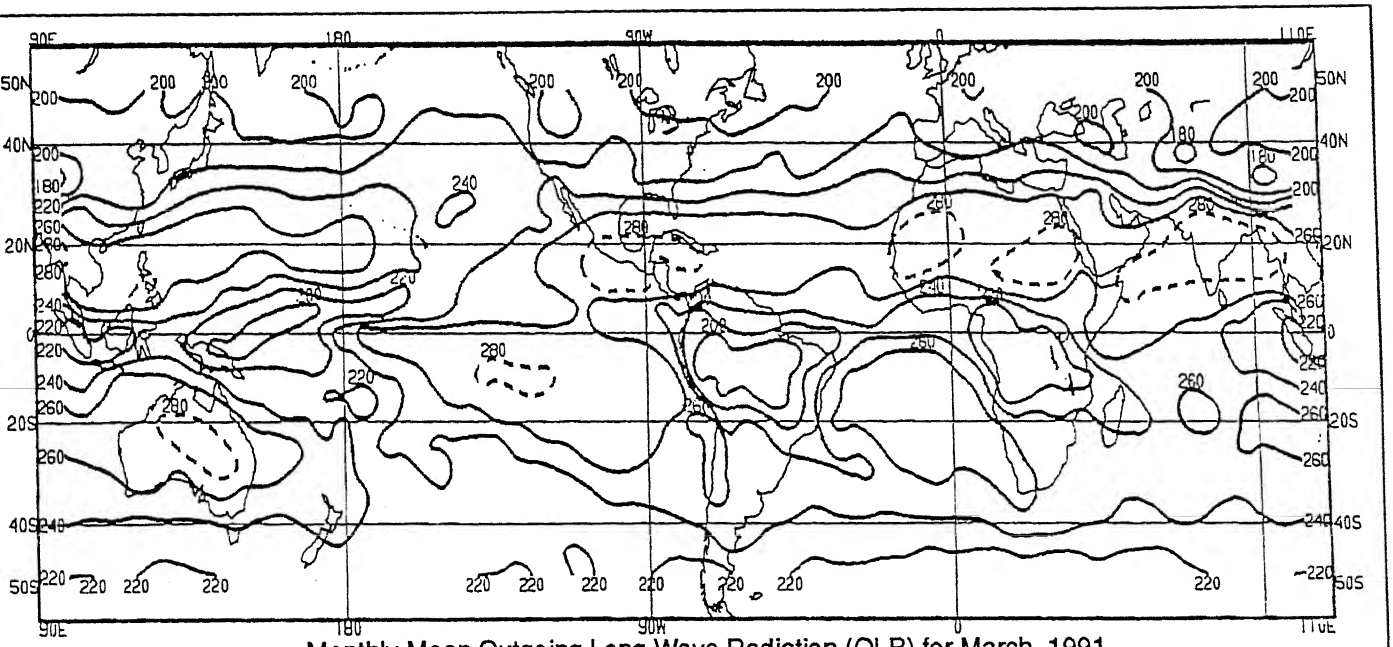
In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

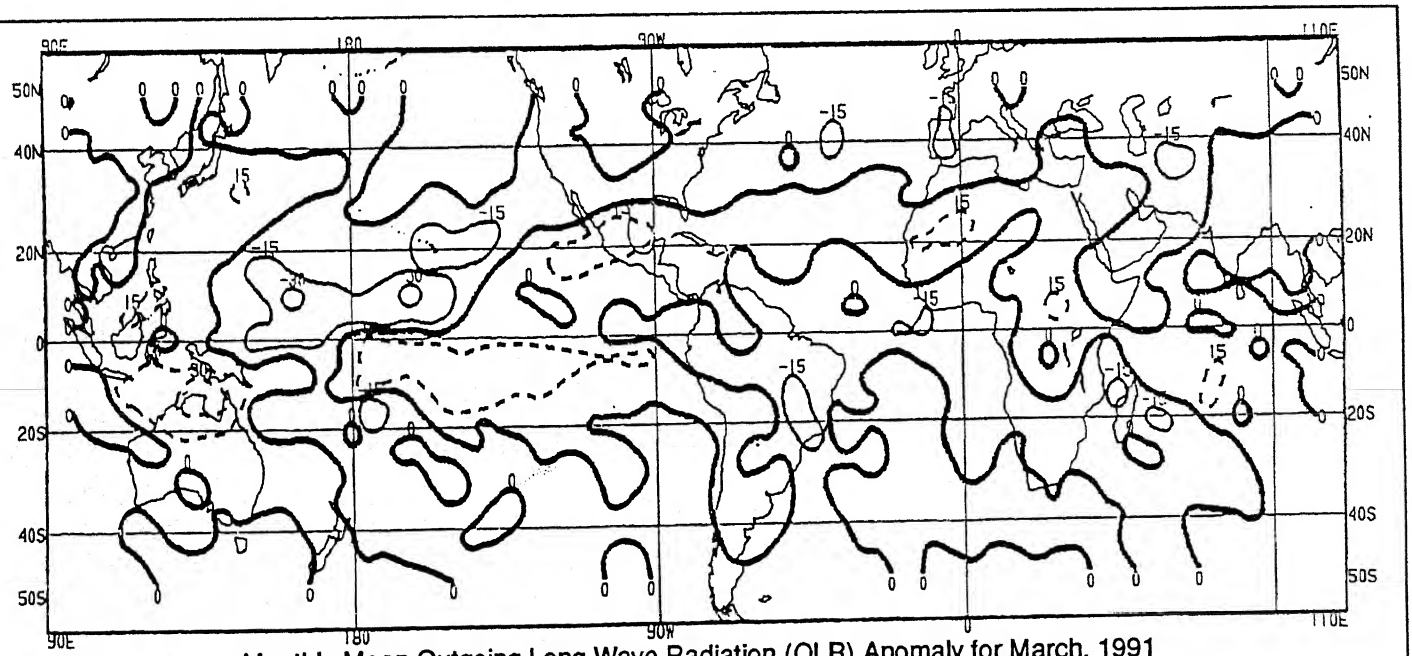


Monthly Mean Outgoing Long Wave Radiation (OLR) for March, 1991

EXPLANATION

The mean monthly outgoing long wave radiation (OLR) as measured by the NOAA–9 AVHRR IR window channel by NESDIS/SRL (top). Data are accumulated and averaged over 2.5° areas to a 5° Mercator grid for display. Contour intervals are 20 Wm^{-2}, and contours of 280 Wm^{-2} and above are dashed. In tropical areas (for our purposes 20°N – 20°S) that receive primarily convective rainfall, a mean OLR value of less than 200 Wm^{-2} is associated with significant monthly precipitation, whereas a value greater than 260 Wm^{-2} normally indicates little or no precipitation. Care must be used in interpreting this chart at higher latitudes, where much of the precipitation is non–convective, or in some tropical coastal or island locations, where precipitation is primarily orographically induced. The approximate relationship between mean OLR and precipitation amount does not necessarily hold in such locations.

The mean monthly outgoing long wave radiation anomalies (bottom) are computed as departures from the 1979 – 1988 base period mean. Contour intervals are 15 Wm^{-2}, while positive anomalies (greater than normal OLR, suggesting less than normal cloud cover and/or precipitation) are dashed and negative anomalies (less than normal OLR, suggesting greater than normal cloud cover and/or precipitation) are solid.



Monthly Mean Outgoing Long Wave Radiation (OLR) Anomaly for March, 1991